Gopal **Sharma**

(+1) 413-406-0713 | gopalsharma@cs.umass.edu | hippogriff.github.io | hippogriff

Education

University of Massachusetts, Amherst *Amherst, MA, USA*

PhD in Computer Science (GPA: 3.95 / 4.0) *2016 - PRESENT*

Indian Institute of Technology (IIT), Roorkee *Roorkee, India*

B.Tech. in Electrical Engineering *2012 - 2016*

Research Interests

Deep Learning, Computer Vision and Reinforcement Learning

Skills

- **Programming Languages:** Python, C++, Matlab/Octave, C
- **Scientific Computing:** Pytorch, TensorFlow, Keras, CuPy, Scipy, Scikit-Learn, OpenCV, Eigen, OpenMP
- **Tools:** Git, Emacs, LaTeX, Visual Studio
- **Courses:** Machine Learning, Intelligent Visual Computing, Probabilistic Graphical Models, Deep Learning, Reinforcement Learning, Statistical Inference

Publications

Conference Papers

- *CSGNet: Neural Shape Parser for Constructive Solid Geometry* **Sharma, Gopal**, Goyal, Rishabh, Liu, Difan, Kalogerakis, Evangelos, and Maji, Subhransu. Computer Vision and Pattern Recognition (**CVPR**) 2018
- *Persistent Aerial Tracking system for UAVs* Mueller, Matthias, **Sharma, Gopal**, Smith, Neil, and Ghanem, Bernard In 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**) 2016

Research Experience

Hierarchical Segmentation of Point Cloud *UMass*

Research Assistantship *On going*

- The aim of the project is to get hierarchical segmentation of point cloud using hierarchical metric learning that samples the triplet according to tree distance in hierarchy.

Program Induction for Visual Domain *UMass*

Research Assistantship *2017-2018*

- The aim of the project is to design a neural shape parser for constructive solid geometry. We use combination of supervised learning and reinforcement learning to induce programs for 2D and 3D shapes. This work has been accepted at CVPR-2018.

Exploring LSTMs for shape recognition *UMass*

Research Assistantship *Sep 2016 Feb 2017*

- The aim of the project was to exploit the sequential information present in uniformly rendered images from 3D shapes. We used LSTMs for processing sequentially rendered images for 3D shape recognition and retrieval tasks.

Exploring filter generation using CPPNs *UMass*

Course Project *Fall 2016*

- The aim of the project was to explore different paradigms where convolution kernels are generated by a neural network using Compositional Pattern Producing Networks, rather than learnt using back-propagation. We show how using locality information to generate kernels can lead to better performance on CIFAR10 and MNIST dataset.

Activity recognition and Object tracking *KAUST*

Summer Internship *May July 2015*

- **Activity recognition:** Developed code (C++, Python and MATLAB) for activity recognition and scene understanding on the Acitivity-Net data-set, which aimed to find semantics between activity, object, and background scenes. Got experience of working with the following state-of-the-art algorithms on object detection like Fast RCNN and object proposals like Edge boxes and Bing.

- **Persistent Object tracking:** Experimentally demonstrated persistent object tracking methodology for swarm of UAVs. Developed a novel algorithm (C++ and python) to use object proposals (BING) for object tracking, based on the existing object trackers. This work was accepted at IROS-2016.

Word recognition in natural scene images *IIIT*

Summer Internship *May July 2016*

- Developed algorithms based on CNNs and bidirectional LSTMs to detect and recognize words in unconstrained natural scenes.